



Department of Environmental Protection

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Commissioner

November 10, 2011

Tom Richard
IPG Photonics Corporation, Inc.
50 Old Webster Road
Oxford, MA 01540

RE: Oxford
Transmittal No.: X237422
Approval No.: CE-11-003
Class: SM50
FMF No.: 340166
SSEIS No. 118-1230
LPA PLAN APPROVAL

Dear Mr. Richard:

The Massachusetts Department of Environmental Protection, Bureau of Waste Prevention, Permitting Section ("MassDEP") has determined that the referenced Limited Plan Application ("LPA") is administratively complete and in conformance with current air pollution control engineering practices. MassDEP **approves** the referenced LPA authorizing the proposed increased operation of the fiber optic device manufacturing facility at the referenced location.

This LPA Plan Approval is in accordance with 310 CMR 7.02 of the Air Pollution Control Regulations ("Regulations"), 310 CMR 7.00, as adopted pursuant to M.G.L. c.111, sections 142A-142N.

Included as part of the LPA Plan Approval are the following:

- Stamped approved **BWP AQ 01-B** Application form,
- Special Conditions (if any).
- General Conditions for Non-Fuel Emission LPAs,

Please review the entire LPA Plan Approval carefully as it stipulates the particular conditions which the facility owner/operator must adhere to for the facility to be constructed/reconstructed/altered and operated in compliance with the Regulations.

MassDEP has determined that the filing of an Environmental Notification Form ("ENF") with the Secretary of Environmental Affairs, for air quality purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act and Regulation 301 CMR 11.00, section 11.04, provide certain "Fail-Safe Provisions" which allow the Secretary to require the filing of an ENF and/or Environmental Impact Report later.

I. FACILITY DESCRIPTION/HISTORY

On November 27, 2000 MassDEP issued Approval Transmittal #W016061 to IPG Photonics Corporation (“the Permittee”) for the construction and operation of this facility. Approval Transmittal #W016061 imposed limits on the emissions of air contaminants from the facility, particularly total Volatile Organic Compounds (VOC)/Hazardous Air Pollutants (HAPs), which was limited to 4.9 tons per year. On November 2, 2010 MassDEP issued Approval Transmittal #X231856 to the Permittee for the purpose of establishing separate emission limits for acetone (set at 9.9 tons per year) and VOC (remained at 4.9 tons per year). On March 22, 2011 the Permittee submitted the present application requesting increases in facility emission limits for VOC because of increased production.

II. PROJECT DESCRIPTION

The Permittee is a manufacturer of fiber optic devices. The following equipment and processes that have the potential to emit contaminants to the ambient air are in use at the facility.

A. Equipment/Processes with insignificant amounts of emissions

- 8 (eight) natural gas fired boilers, each rated at less than 2.5 million BTU per hour (products of combustion emitted)
- Soldering, lead-free plus small amounts of lead solder (small amount of particulates emitted)
- Molecular beam epitaxy (MBE) reactors (small amount of particulates emitted)
- dilute acid baths for cleaning (small amounts of acid vapors emitted)

B. Processes with significant amounts of emissions

- Solvent cleaning in small containers (beakers)
- General solvent cleaning (production area)

The solvents used for cleaning include isopropyl alcohol, AZ Kwik Strip, methanol, and acetone. A significant portion of the solvents used are recovered in waste disposal containers and leave the facility as hazardous waste. The rest of the solvents evaporate and are emitted as fugitive emissions. The fugitive solvent emissions fall into three categories:

- Acetone (non-photochemically reactive hydrocarbon or HYC)
- Volatile Organic Compounds (VOC). Currently isopropyl alcohol is the primary VOC emitted.
- Hazardous Air Pollutants (HAPs). These are VOC compounds that are also on the USEPA HAP list. The individual VOC compounds that are listed HAPs in the present cleaning solvents are glycol ethers (ingredient of AZ Kwik Strip) and methanol.

The original Approval Transmittal #W016061 limited the facility to 4.9 tons per year of emissions from all volatile solvents. The 4.9 tons per year included both HYC and VOC/HAP. The Permittee’s business has grown over the past eleven years and as a result, emissions have increased. The Permittee has implemented waste minimization and process changes to reduce the per unit use of VOC solvents; however, given the increased production at the facility, emissions are approaching the previously approved limits. The new emission limits are 9.9 tons per year of combined non-HAP VOC plus HAP-VOC; and 9.9 tons per year of acetone (HYC) as was approved in Approval Transmittal #X231856 (see Table 1 below).

In addition, in the process of developing data for this application, the Permittee has derived new emission factors for VOC compounds. These emission factors were developed by performing a mass balance on the solvents issued for cleaning and the solvents measured in waste disposal containers and were presented in a letter dated September 13, 2011 from CMG Environmental. The new emission factors are incorporated into this Approval No. CE-11-003.

This Approval No. CE-11-003 (Transmittal #X237422) replaces and supersedes both previous Approvals, Transmittal #W016061 and Transmittal #X231856.

III. SPECIAL CONDITIONS

A. The Permittee shall not exceed the emission limits in the following Table 1.

Table 1				
EU ID ¹	Equipment Description	Pollutant	Emission Limits	
			Short Term Monthly (per calendar month)	Long Term – 12 Month Rolling Total ²
EU #1	Solvent Cleaning	Total VOC ³	1.65 tons/month	9.9 Tons per year combined
		Individual HAP ⁴	0.8 tons/month	4.9 tons per year
		HYC (acetone)	1.65 tons/month	9.9 tons per year

¹ EU # represents Emission Unit Identification

² To calculate the amount of a consecutive 12 month rolling period, take the current calendar month amount and add it to the previous 11 calendar months total amount.

³ Total VOC includes both HAP-VOC and non-HAP VOC.

⁴ Individual HAP means any individual VOC compound that is also a listed HAP. At present the listed individual HAP compounds are glycol ethers and methanol.

B. 1. The Permittee shall use the following emission factors in calculating cleaning solvent emissions:

- a) Isopropyl Alcohol = 72% emitted (non-HAP VOC)
- b) AZ Kwik Strip = 59% emitted. (For purposes of calculating HAP emissions, it shall be assumed that 100% of the portion of AZ Kwik Strip that is emitted is glycol ether, a HAP-VOC.)
- c) Methanol = 100% emitted (HAP-VOC)
- d) Acetone = 100% emitted (HYC).

In addition, for purposes of emission calculations, the emissions shall be counted as occurring at the time that the particular portion of chemical is issued for use.

2. If Permittee wishes to use any alternative emission factors, they must first be approved by MassDEP. Also the Permittee may use alternative solvents not on the above list, provided that

- a) The solvent is first proposed to MassDEP and approved;
- b) The emission factor for the solvent shall be 100% until such time as the Permittee performs measurements and/or provides documentation for another emission factor and MassDEP has approved the emission factor.
- c) Emissions resulting from use of the solvent remain within the approved emission limits in Table 1.

C. The Permittee shall use good housekeeping methods. Good housekeeping is defined as storing, using and disposing of formulations/wipes containing HAPs/VOC in a manner, which will minimize evaporation to the atmosphere. Proper storage shall be in a container with a tight fitting cover and covered containers shall be used during mixing and transferring the HAPs/VOC containing formulations.

- D. The Permittee shall use best management practices to reduce solvent usage and emissions. Best management practices include but are not limited to: eliminating the use of methanol (a HAP) where possible; using cleaning solvents in small containers, and covering them when not in use; and issuing solvents in a controlled and documented manner.

IV. GENERAL CONDITIONS FOR NON-FUEL EMISSION LPAs

- A. **INSTALLATION and OPERATION** - No person shall install or operate the equipment as noted in this plan application except in conformance with the requirements established in this Plan Approval. This Plan Approval is only for the equipment as noted within the application or as may otherwise be specified in the Plan Approval.
- B. **SUSPENSION, MODIFICATION, AMENDMENT OR REVOCATION** - This Plan Approval may be suspended, modified, amended or revoked by MassDEP if, at any time, MassDEP determines that the facility is violating any condition or part of this Plan Approval. This Plan Approval may be modified or amended when in the opinion of MassDEP a modification or amendment is necessary or appropriate to clarify the approval conditions or after consideration of a written request by the Permittee to amend the approval conditions. Any relaxation of an emission limit or a specific condition noted in this Plan Approval that would result in an increase in emission rates as established in this Plan Approval must be made in accordance with 310 CMR 7.02.
- C. **OTHER REGULATIONS** - This Plan Approval does not negate the responsibility of the owner/operator to comply with this or any other applicable federal, state, or local regulations now or in the future. Nor does this Plan Approval imply compliance with any other applicable federal, state or local regulation now or in the future.
- D. **EXISTING APPROVALS** - All plan approvals under 310 CMR 7.02 issued prior to the effective date of this Plan Approval shall continue to be in effect unless specifically changed by this Plan Approval. The facility shall meet the emission rates and approved conditions specified in the applicable plan approval(s) unless specifically altered by this Plan Approval.
- E. **VISIBLE EMISSIONS** - Unless otherwise required by this Plan Approval, opacity, exclusive of uncombined water, shall not exceed 10% at all times during all modes of operation, including startups and shutdowns. Visible emissions or opacity that exceeds the limits set forth in this Plan Approval shall be reported to MassDEP in writing or by fax within seven (7) days of the occurrence.
- F. **DUST AND ODOR** - The facility shall be operated in a manner to prevent the occurrence of dust or odor conditions that may cause or contribute to a condition of air pollution as defined in Regulation 310 CMR 7.01 and 7.09.
- G. **NOISE** - Noise from the facility during routine operation, including startups and shutdowns, shall not exceed MassDEP noise guidelines and shall not cause a condition of air pollution as defined in Regulation 310 CMR 7.01 and 7.10.
- H. **ASBESTOS** - Should asbestos remediation/removal be required as a result of this Plan Approval, such asbestos remediation/removal shall be done in accordance with Regulation 310 CMR 7.15.
- I. **TESTING** -
1. Any emission testing conducted to show compliance with the limitations in this Plan Approval must be conducted in accordance with the Environmental Protection Agency test methods as specified in the Code of Federal Regulations, Title 40, Part 60, Appendix A - Standards of Performance for New Stationary Sources or

by another method correlated to the above method to the satisfaction of MassDEP and in accordance with the requirements noted in 310 CMR 7.13.

2. In accordance with 310 CMR 7.13, MassDEP may require testing for any pollutants if deemed necessary to ascertain the emission rates and relationship to equipment design and operation. When informed in writing by MassDEP that stack testing is necessary to ascertain compliance with the Air Pollution Control Regulations or design approval provisions the Permittee shall conduct the required stack testing. Such stack testing shall be:
 - a) Conducted by a person knowledgeable in stack testing,
 - b) Conducted in accordance with procedures contained in a test protocol which has been approved by MassDEP, and
 - c) In the presence of a representative of MassDEP when such is deemed necessary in accordance with 310 CMR 7.13.

J. RECORD KEEPING -

1. A record keeping system shall be established and continued on site by the Permittee. All records shall be maintained up-to-date such that twelve-month rolling period information is readily available for Department examination. Record keeping shall include, at a minimum:
 - a) The initiation and completion dates for the proposed construction, reconstruction or alteration.
 - b) Compliance records sufficient to demonstrate that emissions of air contaminants have not exceeded what is allowed by this Plan Approval. An electronic version in Microsoft Excel of the MassDEP approved Reporting Form can be downloaded at: <http://www.mass.gov/dep/air/approvals/aqforms.htm#report>. Such records may include daily production records, raw material usage rates, fuel purchase receipts, emissions test results, monitoring equipment data and reports.
 - c) Maintenance: A record of routine maintenance activities performed on emission unit, control equipment and monitoring equipment including, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.
 - d) Malfunctions: A record of all malfunctions on emission unit, control equipment and monitoring equipment including, at a minimum: the date and time the malfunction occurred; a description of the malfunction and the corrective action taken; the date and time corrective actions were initiated; and the date and time corrective actions were completed and the emission unit returned to compliance.
2. All records shall be kept on site for five (5) years and shall be made available to MassDEP upon request.
3. Pursuant to the authority granted to MassDEP at 310 CMR 7.02, the facility shall maintain a copy of this Plan Approval, and any subsequent modifications of this Plan Approval, on-site for as long as the Plan Approval is valid. The Plan Approval is valid until one of the following conditions occur: the equipment is dismantled or removed from the facility, the facility notifies MassDEP that the Plan Approval is no longer valid, the equipment is substantially reconstructed or altered and subject to 310 CMR 7.02, the Plan Approval is superseded by another Plan Approval, or MassDEP revokes the Plan Approval in accordance with 310 CMR 7.02. MassDEP may revoke, in accordance with 310 CMR 7.02, any Plan Approval if the actual construction has not begun within two years from the date of issuance or if, during the construction, the construction is suspended for the period of one year or more.

K. REPORTING -

1. The Permittee shall submit a Source Registration/Emission Statement Form to MassDEP on an annual or tri-annual basis as required by 310 CMR 7.12.

2. Any construction, substantial reconstruction or alteration, as described in 310 CMR 7.02, of equipment as noted within this Plan Approval application at this facility shall be reported in writing to MassDEP 30 days prior to said construction, substantial reconstruction or alteration and on the next required source registration.
 3. The Regional Bureau of Waste Prevention, Compliance and Enforcement office, must be notified by telephone, email, or fax as soon as possible (but no later than 24 hours) after the occurrence of any exceedance of an emission limit as noted within this Plan Approval OR any upsets or malfunctions to the facility equipment, air pollution control equipment, or monitoring equipment which result in an excess emission to the air, a violation of any conditions of this Plan Approval and/or a condition of air pollution.
- L. **REMOVAL OF AIR POLLUTION CONTROL EQUIPMENT** - Notwithstanding 310 CMR 7.02, no person shall cause, suffer, allow, or permit the removal, alteration or shall otherwise render inoperative any air pollution control equipment or equipment used to monitor emissions which has been installed as a requirement of 310 CMR 7.00, other than for reasonable maintenance periods or unexpected and unavoidable failure of the equipment, provided that MassDEP has been notified of such failure, or in accordance with specific written approval of MassDEP.
- M. **MONITORING** - Equipment or emission monitoring systems installed for the purpose of documenting compliance with this Plan Approval shall be installed, calibrated, maintained and operated by the Permittee in sufficient manner to ensure continuous and accurate operations at all times.
- N. **COMPLIANCE ASSURANCE FEE** - Pursuant to 310 CMR 4.03, an annual fee, based on the Commonwealth's fiscal year, will be charged to your facility to cover the cost of compliance activities performed by MassDEP, including registrations, report reviews, inspections, source registration reviews, etc. No fee shall be charged in the fiscal year that the permit is issued. If multiple air quality permits exist for a facility, the facility shall pay the single highest applicable fee. This fee does not include stack test fees.

V. APPEAL

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations. The hearing request along with a valid check payable to Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below.

The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority. MassDEP may waive the adjudicatory hearing filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Should you have any questions concerning this Plan Approval, please contact Paul Dwiggins at (508) 767-2760.

Sincerely,

*This final document copy is being provided to you electronically by the
Department of Environmental Protection. A signed copy of this document
is on file at the DEP office listed on the letterhead.*

Roseanna E. Stanley
Section Chief,
Bureau of Waste Prevention

RES/PD

ecc: Yi Tian, Dana Samuelson, MassDEP